

CLAIMS

1. A dopaminergic neuron proliferative progenitor cell marker polynucleotide probe comprising a sequence selected from the following nucleotide sequences (1) to (5):
 - 5 (1) a nucleotide sequence complementary to a nucleotide sequence of SEQ ID NO: 1 or 2;
 - (2) a nucleotide sequence complementary to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO: 3 or 4;
 - (3) a nucleotide sequence complementary to a nucleotide sequence encoding a sequence lacking a transmembrane domain in an amino acid sequence of SEQ ID NO: 3 or 4;
 - 10 (4) a nucleotide sequence that hybridizes under stringent conditions with a polynucleotide consisting of a nucleotide sequence of SEQ ID NO: 1 or 2; and,
 - (5) a nucleotide sequence comprising at least 15 contiguous nucleotides selected from sequences of (1) to (4).

- 15 2. An antibody against a polypeptide selected from the following (1) to (6):
 - (1) a polypeptide encoded by a nucleotide sequence of SEQ ID NO: 1 or 2;
 - (2) a polypeptide comprising an amino acid sequence of SEQ ID NO: 3 or 4;
 - (3) a polypeptide comprising an amino acid sequence lacking a transmembrane domain in an amino acid sequence of SEQ ID NO: 3 or 4;
 - 20 (4) a polypeptide comprising an amino acid sequence with a deletion, insertion, substitution, or addition of one or more amino acids in an amino acid sequence of SEQ ID NO: 3 or 4;
 - (5) a polypeptide encoded by a nucleotide sequence that hybridizes under stringent conditions with a sequence complementary to a nucleotide sequence of SEQ ID NO: 1 or 2; and,
 - (6) a polypeptide that is a fragment of a polypeptide of (1) to (5) comprising at least 8
25 amino acid residues.

3. A method of selecting a dopaminergic neuron proliferative progenitor cell, wherein the method comprises the step of contacting the polynucleotide of claim 1 with a cell sample thought to comprise a dopaminergic neuron progenitor cell.
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4. A method of selecting a dopaminergic neuron proliferative progenitor cell, wherein the method comprises the step of contacting the antibody of claim 2 with a cell sample thought to comprise a dopaminergic neuron progenitor cell.

- 35 5. A method of selecting a dopaminergic neuron proliferative progenitor cell comprising the steps of:

- (1) selecting a dopaminergic neuron progenitor cell using the method of selecting a dopamine-producing neuron progenitor cell of claim 3 or 4;
- (2) culturing the progenitor cell selected in (1); and,
- (3) screening the progenitor cell cultured in (2) using a postmitotic neuron marker.

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6. A dopaminergic neuron proliferative progenitor cell prior to cell cycle exit selected using the method of any one of claims 3 to 5.

7. A method of isolating a gene specific to a dopaminergic neuron progenitor cell and a gene specific to each maturation stage of the progenitor cell differentiating into a dopaminergic neuron, wherein the method comprises the step of detecting and isolating a gene specifically expressed in the progenitor cell of claim 6, or a cell differentiated, induced, or proliferated from the progenitor cell.

8. A method of screening using maturation as an index, wherein the method comprises the steps of contacting a test substance with the progenitor cell of claim 6, and detecting the differentiation or proliferation of the progenitor cell induced by the contact.